

BTR-5601MG / BTR-5601AMG

1310 nm TX / 1550 nm RX , 3.3V / 622 Mb/s **RoHS Compliant** Single-Fiber MM Transceiver

FEATURES

- Single Fiber Bi-Directional MM Transceiver
- 1310 nm LD Transmitter
- 1550 nm Receiver
- Link distance 0 to 1000 m
- Industry Standard 1 x 9 Footprint
- Single +3.3 V Power Supply
- RoHS Compliant
- Speed up to 650 Mb/s
- 0 to 70°C Operating: BTR-5601MG
- -20 to 85°C Operating: BTR-5601AMG
- PECL Differential Inputs and Outputs
- Wave Solderable
- Class 1 Laser International Safety Standard IEC-60825 Compliant

APPLICATIONS

- WDM 622 Mb/s Links
- SONET / SDH Equipment Interconnect

DESCRIPTION

The BTR-5601MG series are high performance modules for multi-mode single fiber communications by using 1310 nm transmitter and 1550 nm receiver. The transmitter section uses a multiple quantum well laser and is a class 1 laser compliant according to International Safety Standard IEC-60825. The receiver section uses an integrated 1550 nm detector preamplifier (IDP) mounted in an optical header and a limiting post-amplifier IC. A PECL logic interface simplifies interface to external circuitry.

LASER SAFETY

This multi-mode transceiver is a Class 1 laser product. It complies with IEC-60825 and FDA 21 CFR 1040.10 and 1040.11. The transceiver must be operated within the specified temperature and voltage limits. The optical ports of the module shall be terminated with an optical connector or with a dust plug.

ORDER INFORMATION

P/No.	Bit Rate (Mb/s)	Distance (m)	TX (nm)	RX (nm)	Voltage (V)	Package	Temp. (°C)	TX Power (dBm)	RX Sens. (dBm)	RoHS Compliant
BTR-5601MG	622	0 to 1000	1310	1550	3.3	1X9 SC	0 to 70	-8 to -15	-26	Yes
BTR-5601AMG	622	0 to 1000	1310	1550	3.3	1X9 SC	-20 to 85	-8 to -15	-26	Yes

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Units	Notes
Storage Temperature	Tstg	-40	85	°C	
Operating Temperature	Topr	0 -20	70 85	°C	BTR-5601MG BTR-5601AMG
Soldering Temperature	---		250	°C	10 seconds on leads only
Power Supply Voltage	Vcc	0	4.5	V	
Input Voltage	---	GND	Vcc	V	
Output Current	Iout	0	30	mA	

Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Units / Notes
Power Supply Voltage	Vcc	3.13	3.3	3.47	V
Operating Temperature	Topr	0 -20		70 85	°C / BTR-5601MG °C / BTR-5601AMG
Data Rate			622	650	Mb/s
Power Supply Current	Icc			260	mA

Transmitter Specifications (0°C < Topr < 70°C, 3.13V < Vcc < 3.47V)

Parameter	Symbol	Min	Typ	Max	Units	Notes
Optical						
Optical Transmit Power	Po	-15	---	-8	dBm	1
Output Center Wavelength	λ	1260	1310	1360	nm	
Output Spectrum Width	$\Delta\lambda$	---	---	5	nm	RMS(σ)
Extinction Ratio	E_R	8.2	---	---	dB	
Optical Rise Time	t_r			1.2	ns	10% to 90% Values
Optical Fall Time	t_f			1.2	ns	10% to 90% Values
Relative Intensity Noise	RIN			-116	dB/Hz	
Total Jitter	TJ			0.55	ns	2
Electrical						
Data Input Current – Low	I_{IL}	-350			μ A	
Data Input Current – High	I_{IH}			350	μ A	
Differential Input Voltage	$V_{IH} - V_{IL}$	300			mV	
Data Input Voltage – Low	$V_{IL} - V_{CC}$	-2.0		-1.58	V	3
Data Input Voltage -- High	$V_{IH} - V_{CC}$	-1.1		-0.74	V	3

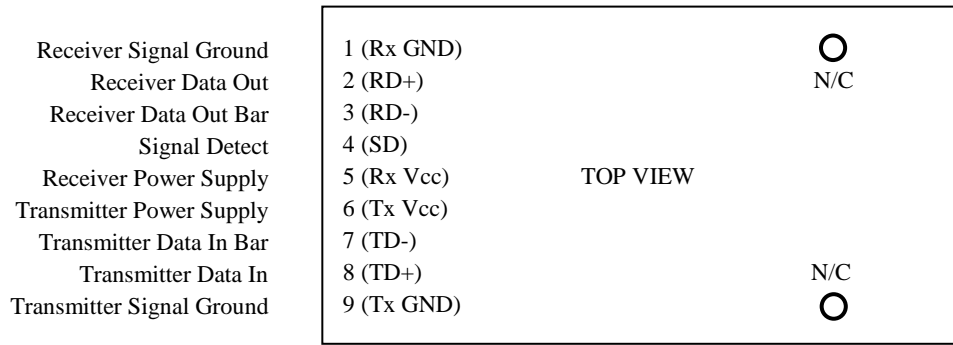
- Notes: 1. Output power is power coupled into a 62.5/125 μ m multi-mode fiber.
 2. Measured with a 2²³-1 PRBS with 72 ones and 72 zeros.
 3. These inputs are compatible with 10K, 10KH and 100K ECL and PECL inputs.

Receiver Specifications (0°C < Topr < 70°C, 3.13V < Vcc < 3.47V)

Parameter	Symbol	Min	Typ	Max	Units	Notes
Optical						
Sensitivity	---	---	---	-26	dBm	1
Maximum Input Power	Pin	-8	---	---	dBm	
Signal Detect -- Asserted	Pa	---	---	-26	dBm	Transition: low to high
Signal Detect -- Deasserted	Pd	-40	---	---	dBm	Transition: high to low
Signal detect -- Hysteresis		1.0	---		dB	
Wavelength of Operation		1480	---	1600	nm	2
Electrical						
Data Output Voltage – Low	$V_{OL} - V_{CC}$	-2.0		-1.58	V	3
Data Output Voltage – High	$V_{OH} - V_{CC}$	-1.1		-0.74	V	3
SD Output Voltage -- Low	$V_{OL} - V_{CC}$	-2.0		-1.58	V	3
SD Output Voltage -- High	$V_{OH} - V_{CC}$	-1.1		-0.74	V	3

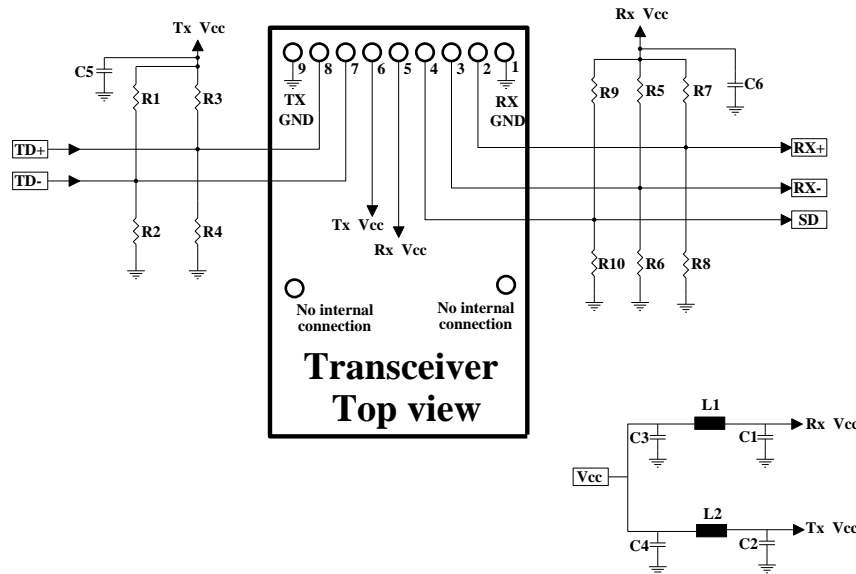
- Notes: 1. Minimum sensitivity and saturation levels at BER=1E-10 for a 2²³-1 PRBS.
 2. At least 30 dB optical isolation for the wavelength 1260 to 1360 nm.
 3. These outputs are compatible with 10K, 10KH and 100K ECL and PECL outputs.

CONNECTION DIAGRAM



PIN	Symbol	Notes
1	Rx GND	Directly connect this pin to the receiver ground plane
2	RD+	See recommended circuit schematic
3	RD-	See recommended circuit schematic
4	SD	Active high on this indicates a received optical signal
5	Rx Vcc	+3.3V dc power for the receiver section
6	Tx Vcc	+3.3V dc power for the transmitter section
7	TD-	See recommended circuit schematic
8	TD+	See recommended circuit schematic
9	Tx GND	Directly connect this pin to the transmitter ground plane

RECOMMENDED CIRCUIT SCHEMATIC

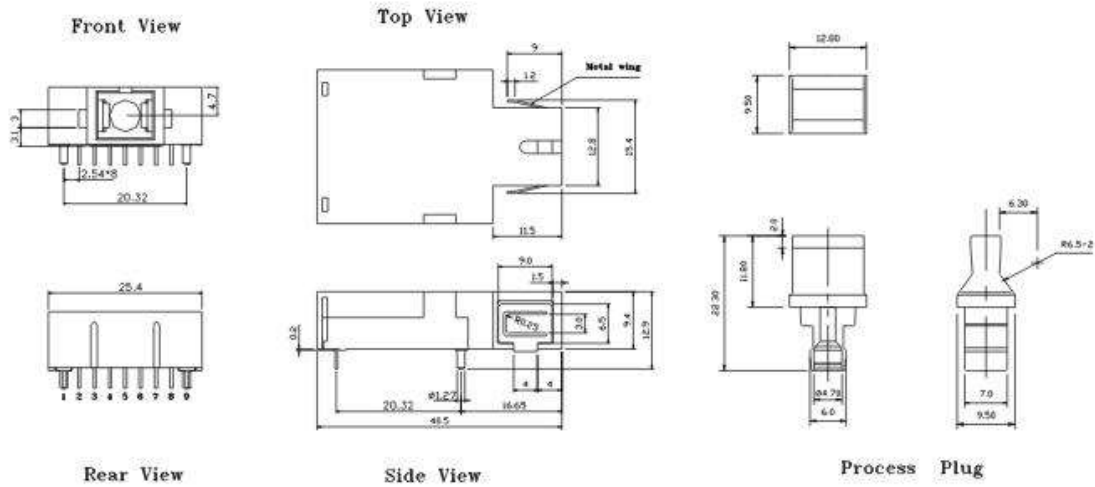


R1=R3=R5=R7=R9=130 ohm
R2=R4=R6=R8=R10=82 ohm
C1=C2=C3=C5=C6=0.1 Uf
C4=10uF L1=L2=1uH

The split-load terminations for ECL signals need to be located at the input of devices receiving those ECL signals. The power supply filtering is required for good EMI performance. Use short tracks from the inductor L1/L2 to the module Rx Vcc and Tx Vcc. A GND plane under the module is required for good EMI and sensitivity performance.

PACKAGE DIAGRAM

Units in mm



Note: Specifications subject to change without notice.